METHODS AND APPLICATION FOR CAPTURING IMAGE CONTENT CONFORMING TO ELECTRONIC DEVICE FORMAT

FIELD OF THE DISCLOSURE

[0001]   The present disclosure relates generally to image capture applications, and more particularly to image capture applications in graphical user interface computing environments, for example, on windows based personal computers, for capturing and tailoring image information for use in a particular electronics device, for example, in a wireless communications device, and methods.

BACKGROUND OF THE DISCLOSURE

[0002]   Recent advancements in display technology and market factors have resulted in the widespread emergence of an array of relatively low-cost handheld portable electronics devices, for example, cellular telephones and personal digital assistants, among other devices, including relatively high resolution color displays, most commonly in the form of liquid crystal displays. The displays on these devices generally have however different aspect ratios, resolutions, color depths, and other particular characteristics.

[0003]   Presently, there is no quick and easy way for users to import images onto wireless handsets and other electronics devices for personal use and for sharing. These images usually originate from a variety of sources, each potentially having its own application, file-types, size, aspect ratio, color depth, etc., which adds to the complexity of the task.

[0004]   Although PC software, for example, "Mobile PhoneTools", exists for importing files onto wireless communications handsets, the complexity of the task, which includes navigating a file system and manipulating images to match the size, resolution and type of the target device is unappealing to the casual users constituting the bulk of the market.

[0005]   The various aspects, features and advantages of the disclosure will become more fully apparent to those having ordinary skill in the art upon careful consideration of the following Detailed Description thereof with the accompanying drawings described below.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006]   FIG. 1 illustrates an exemplary image-capture application running in a graphical user interface computing environment.

[0007]   FIG. 2 is an exemplary process flow diagram.

[0008]   FIG. 3 illustrates an exemplary image capture utility viewfinder-invoking hot key.

[0009]   FIG. 4 illustrates the transfer of captured image information to a recipient device during synchronization.

[0010]   FIG. 5 illustrates an exemplary puzzle-generating feature or application.

[0011]   FIG. 6 illustrates a puzzle game on a wireless communications device.

DETAILED DESCRIPTION

[0012]   In FIG. 1, an exemplary image-capture application 100 is illustrated running in a computing environment 120 that displays image information, for example, a graphical user interface (GUI) environment. The exemplary GUI in FIG. 1 is a MICROSOFT WINDOWS environments, though in other embodiments it could be any other environment, for example, the APPLE MACINTOSH operating system, among others, some of which are known and others to be developed.

[0013]   The exemplary image capture application 100 comprises generally an image viewfinder 110 that may be dragged or otherwise positioned about the GUI environment by the user, for example, by movement of a cursor 120 or by some other user operable controller. The image viewfinder 110 is generally positioned over an image displayed in the GUI environment. In FIG. 1, for example, the image viewfinder 10 is positioned over an image displayed in an MS INTERNET EXPLORER application, though the viewfinder 110 may be positioned about the exemplary WINDOWS desktop and/or application running thereon. In the exemplary WINDOWS environment and similar environments, the image viewfinder 110 is movable over the applications running on the WINDOWS desktop. More generally, the viewfinder 110 may be positioned over images

or graphics information displayed in or by any application in the GUI environment. Upon locating an image or graphical information desired, the image or information is subsequently captured for transfer to a recipient device as discussed more fully below.

[0014]   The viewfinder 110 of the image capture application is invoked by a viewfinder-invoking feature accessible via the graphical user interface (GUI) computing environment on which the image capture application resides or by a hard or soft hotkey. In the process flow diagram 200 of FIG. 2, the image capture application is invoked at block 210, resulting in the display of the of the image viewfinder. In the exemplary embodiment, the image capture application may be launched by any known mode including, among others, selection of a corresponding application icon located on the desktop or in WINDOWS START menu. FIG. 3 illustrates an exemplary hotkey, "PrintScrn", 301 that may be used for invoking the image capture application, which could run as a dormant application or utility. The image capture invoking feature or mechanism is preferable selected to minimize the effort required to launch the image capture application. In FIG. 2, at block 220, upon invoking the image capture application and displaying the image viewfinder, the viewfinder may be moved about the display and positioned over an image to be captured.

[0015]   According to one aspect of the disclosure, the image viewfinder 110 has an aspect ratio of a display on a corresponding device to which an image captured on the GUI computing environment will be transmitted. Exemplary recipient devices include wireless communications devices and

other electronics devices having displays with a particular aspect ratio. Mobile wireless communications, personal digital assistants and other electronics device typically have display aspect ratios of 4/3 or 16/9. These exemplary aspect ratios are not intended to limit the scope of the disclosure, but instead illustrate the variety of display aspect ratios in common usage.

[0016]   In some embodiments, the image capture utility includes an aspect ratio selection feature, for example, a pull-down menu, allowing a user to select one of several different aspect ratios. The different aspect ratio selections could be specified in terms of aspect ratios, or in terms of the different devices to which they correspond, thus relieving the user of possessing specific knowledge of the aspect ratio for a particular device. In other embodiments, the image capture utility has only a single fixed aspect ratio.

[0017]   In some embodiments, the dimensions of the viewfinder window may be increased or decreased, for example, to accommodate or frame different size images in the host application. The viewfinder may be re-dimensioned by stretching one of the sides of the viewfinder frame portion 112, as is known generally in window applications and environments. According to a related aspect of the disclosure, the aspect ratio remains constant when the viewfinder dimensions are changed, thereby allowing users to frame a particular image while maintaining the aspect ratio for particular recipient device. In FIG. 2, at block 230, the viewfinder is re-dimensioned, if necessary to accommodate the image displayed.

[0018]   In FIG. 2, at block 240, the image over which the image viewfinder is positioned is captured.   In some embodiment, the image capture process includes storage of the image captured in memory, for example, in random access memory.   Also, in some embodiments, the captured image is provided a name. In FIG. 1, the exemplary viewfinder 110 includes an image capture button 114, which may be selected, for example, by positioning the cursor or pointer 122 and clicking on it.   In other embodiments, the image capture function may be performed by some other mechanism.   Thus the aspect ration of the captured image will conform to the aspect ratio of the recipient device.

[0019]   In FIG. 2, at block 250, the image captured is further conformed to an electronic format of a recipient device, for example, for the device to which the aspect ratio of the image viewfinder corresponds.   In one embodiment, the captured image is automatically conformed to the electronic format of the recipient device upon capturing the image without further input from the user. Examples of image characteristics that may be automatically conformed to the format of the recipient device are discussed further below. In other embodiments, additional user input is required to conform the image.

[0020]   In one embodiment, the format of the image is captured is conform to a format of the recipient device. Some common image formats include JPEG, GIF and PNG. Other exemplary image formats include BMP, SVG, SWF, SMIL, MPEG, MOV, AVI, among others. The re-formatting of

the image may result in a change in the file name, for example, a change in the file extension. Thus the format of the image captured may also be made to conform to that of the recipient device. In some embodiments, the image capture application enables the user to select one of several formats, for example, from a pull-down window. In other embodiments, the image capture application formats captured images to a single format corresponding to the format of the recipient device.

[0021]   In another embodiment, the color depth of the captured image is conformed to a color depth the recipient device. Color depth is generally the distinct number of colors that may be presented or displayed by the recipient device. In other embodiments, the image captured may be re-sized to conform to a display size of recipient device. Exemplary wireless cellular communications device display sizes include 96x64, 128x96, 128x160 and 176x220 pixels. Some or all of these and other characteristics of the captured image may be conformed to the recipient device.

[0022]   In FIG. 2, at block 260, the captured image is transmitted, either wirelessly or by wire-line, to the recipient device after any conforming by the image-capture application. Thus, for example, the transferred image may have any one or more of the same aspect ratio, color depth, size, format etc. of the recipient device, thus enabling the recipient device to display the image with little or no subsequent conforming by the recipient device. In some embodiments, the captured image is transferred to the recipient device in a message format, for example, as an EMS, SMS, MMS or some

other message format.   Alternatively, the message could be an e-mail message.

[0023]   In another embodiment the captured image may be transferred to the recipient device during synchronization with the GUI computing environment. In FIG. 4, one or more captured images are transferred to the recipient device in a folder.   Upon transferring the images onto the recipient device, the images may be viewed or otherwise displayed, for example, as wallpaper.   The images may also be communicated to other devices, for example, via messages.

[0024]   In the exemplary embodiment illustrated in FIG. 5, the application 500 running on the GUI computing environment includes a puzzle-generating feature. Selection of the puzzle maker may be made, for example, by selecting a radio button on the image viewfinder.   In other embodiments, however, the game-generating feature is a separate application, which may be invoked by means known to those of ordinary skill in the art.

[0025]   In the exemplary embodiment illustrated in FIG. 5, the puzzle making feature or application is characterized by the formation or division of the captured image over which the viewfinder is positioned into an n X m matrix of pixels or image tiles.   In FIG. 5, the image is divided into a 3 X 3 matrix, though in other embodiments the matrix may be other dimensions. Also, the matrix dimensions may not be even, for example, the matrix of image tiles could be a 4 X 3 matrix.   In some embodiments, the user may

select the matrix size. More image tiles make the puzzle more complex, and less make it less complex, as discussed further below. In embodiments, where the user selects the matrix size, the selection may be made from a pull-down menu. In FIG. 5, the matrix size is indicated on the viewfinder at 510. The user must select one of the image tiles for removal, for example, using the cursor 501. In FIG. 5, tile 520 has been selected for removal. Generally, the tile selected for removal will be one that contains less significant image information relative to the other tiles, though the user is free to select any tile for removal. Upon selecting an image tile for removal, the application generates the puzzle game, which is transmitted to the recipient device as discussed above in connection with the captured image. Also, in some embodiments, the image of the puzzle game is conformed to the format of the recipient device, as discussed above.

[0026]   In FIG. 6, the puzzle game is displayed on an exemplary electronic device 600. In one embodiment, the puzzle game may be run as an application on the host device. The puzzle game includes an image tile scrambling mechanism to disorder the image displayed as wallpaper. In one embodiment, the scrambling mechanism may be a button on the application. In another embodiment, the scrambling mechanism may be by manually moving the tiles about the display, for example, by using the directional input 610 in FIG. 6. The puzzle game may also be transmitted to other devices.

[0027]   While the present disclosure and what are presently considered to be the best modes thereof have been described in a manner establishing

possession by the inventors and enabling those of ordinary skill in the art to make and use the same, it will be understood and appreciated that there are many equivalents to the exemplary embodiments disclosed herein and that modifications and variations may be made thereto without departing from the scope and spirit of the inventions, which are to be limited not by the exemplary embodiments but by the appended claims.

[0028]   What is claimed is: